

Remarks/Arguments

35 U.S.C. §103

Claims 1-9 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,361,865 (Shono) in view of USPN 20050099827(Sase et al). In this response, claims 1 and 2 are amended. Claim 1 has been amended to recite that an external capacitor is coupled with a first terminal to the connection and with the second terminal to ground, the capacitor being charged and discharged by the integrated circuit, as disclosed in the specification on page 3, third paragraph and page 7, second paragraph, and as shown in figures 1 and 2. Further, a switching stage is included in amended claim 1, as disclosed in present claim 2 and in the specification on page 6, last paragraph and shown in figure 2. The switching stage provides in addition a charging of the capacitor by means of an oscillation occurring on the secondary winding after a discharge phase of the transformer, as disclosed on page 10, second paragraph. Claim 2 has been amended to reflect the changes of claim 1.

The present invention is based on a switch mode power supply comprising a transformer, a switching transistor, an integrated circuit comprising a driver stage and a control circuit with an oscillator for the operation of the switching transistor, and a capacitor coupled to the oscillator for adjusting a switching frequency of the driver stage, as described with regard to figure 1, which is prior art. According to the invention, the switched mode power supply comprises in addition a switching stage arranged between the connection and the secondary winding for charging the capacitor in addition by means of an oscillation occurring at the secondary winding after a discharge phase of the transformer, in order to determine the switch-on time of the switching transistor, as described in amended claim 1.

The switching stage provides therefore a switching-on of the switching transistor after the discharge phase of the transformer, which allows to reduce the switch-on losses and therefore the heat loss of the switching transistor, as described on page 5, first and second paragraph. The invention provides in particular a low loss standby operation, as described on page 12, first paragraph.

The reference Shono, US 4,361,865, describes a switched mode power supply having a transformer with a primary winding and secondary windings, a switching transistor and a control stage with a driver stage. A first secondary winding provides a variable direct current via a resistor and a diode for switching through the switching transistor and a second secondary winding charges a capacitor via a diode, whereby the voltage across the capacitor defines the turn-off of the switching transistor. Not disclosed in the references is a capacitor coupled with a first terminal to a connection of an oscillator and with a second terminal to ground, the capacitor being charged and discharged by an integrated circuit for adjusting a switching frequency of the driver stage. Also not shown is a switching stage as defined in amended claim 1.

Sase et al. disclose a resonant converter with a transformer, a switching transistor, a switching stage, an integrated circuit for the operation of the switching transistor and a resonant capacitor arranged between a primary winding of the transformer and the switching transistor for providing resonant operation of the switched mode power supply. But Sase et al. do not show

“an external capacitor coupled with a first terminal to said connection and with a second terminal to ground, said capacitor being charged and discharged by said integrated circuit for adjusting a switching frequency of the driver stage”

Further, Sase et al. does not show

“a switching stage arranged between said first terminal and the secondary winding for charging said capacitor in addition by means of an oscillation occurring on the secondary winding after a discharge phase of the transformer in order to determine the switch-on time of the switching transistor”.

The resonant converter of Sase et al. in particular does not show an integrated circuit including an oscillator, which oscillation frequency is defined by an external capacitor, because the switching frequency of the resonance converter is defined essentially by a resonant capacitor and a resonant coil arranged in series with the primary winding of the transformer. The switched mode power supply of the present invention is in particular applicable for a flyback converter, as described in

the specification on page 2, second paragraph and page 7, second paragraph. The design of the power supply of Sase et al. is therefore completely different with regard to the design of the power supply of the present invention. The reference Sase et al. therefore cannot provide any suggestion for a person skilled in the art to modify the power supply described by Shono in the direction of the switched mode power supply as described in amended claim 1, because Sase et al. does not use a capacitor and a switching stage as described in amended claim 1. In view of the preceding remarks, Applicant respectfully asserts that claim 1 is non-obvious over Shono in view of Sase et al, and is patentable. Withdrawal of the rejection of claim 1 is sincerely solicited.

Claims 2-9, being dependent on and further limiting a base claim or a claim dependent on a base claim that is believed to be allowable, are themselves also allowable. Withdrawal of the rejection of claims 2-9 is respectfully requested.

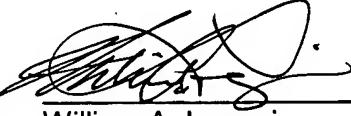
Claims 10 and 11 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Shono in view of Sase et al and further in view of Panov Y et al. The reference Panov et al discloses also a switched mode power supply having a transformer with a primary winding and a secondary winding, a switching transistor and an integrated circuit for the operation of the switching transistor. But Panov et al do not show a switching stage arranged between a first terminal of a capacitor and a secondary winding for charging the capacitor in addition. The reference Panov et al therefore cannot provide any suggestion for a person skilled in the art to modify the power supply described by Shono and Sase et al. in the direction of the switched mode power supply as described in amended claim 1, because Panov et al does not use a switching stage as described in amended claim 1. For the preceding reasons as well as that claims 10 and 11 depend from claims that are believed to be allowable, claims 10 and 11 are believed to be allowable.

Having fully addressed the Examiner's rejections it is believed that, in view of the preceding amendments and remarks, this application stands in condition for allowance. Accordingly then, reconsideration and allowance are respectfully solicited. If, however, the Examiner is of the opinion that such action cannot be taken, the Examiner is invited to contact the applicant's attorney at

(317) 587-4029, so that a mutually convenient date and time for a telephonic interview may be scheduled.

No additional fee is believed due. However, if an additional fee is due, please charge the additional fee to Deposit Account 07-0832.

Respectfully submitted,



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I hereby certify that this amendment is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to Mail Stop AMENDMENT, Commissioner for Patents, Alexandria, Virginia 22313-1450 on:

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Date



William A. Lagoni